



# E - Bio Handout

## The Nine Major Phyla of Kingdom Animalia (See Biology 11 On-Line Invertebrate Activity)

### 1. Phylum Porifera - The Sponges:

- Habitat:** mainly marine (salt water)
- Sponges have a porous body wall. The pores or holes allow water to pass through this animal. Floating food particles are caught once they are inside the sponge.
- Adult sponges are sessile feeders which means these animals are attached to shells or rocks on the ocean floor as they feed.
- Shape:** asymmetrical which means no definite shape.

### 2. Phylum Coelenterata – The Coelenterates: jellyfish, hydras, corals

- Habitat:** marine
- Body wall:** Their body wall is made of 2 cell layers called the ectoderm and endoderm. The ectoderm is the outside layer while the endoderm is found on the inside layer. A jellylike material is found between these 2 layers.
- Digestive System:** The digestive system is incomplete which means that coelenterates have just one opening to the digestive cavity. This single opening serves as both its mouth and anus.
- Symmetry:** radial
- Specialized Cells:** 1. Most coelenterates have tentacles that contain stinging cells that are used for protection and capturing food. 2. Their bodies contain a nerve network that allows movement of the tentacles and body.

### 3. Phylum Platyhelminthes – The Flatworms: planaria, tapeworms

- Habitat:** fresh and salt water; terrestrial(land)
- Body Plan:** These animals are given their name because of their flattened bodies. Flatworms have 3 distinct tissue layers called the ectoderm, endoderm, and mesoderm or middle layer. Each layer gives rise to the various organs and systems of this animal.
- Digestive System:** In free-living species of flatworms the digestive system is incomplete which means that the digestive cavity has only a single opening. The parasitic tapeworm has no need for a digestive system because it absorbs nutrients that are already digested by the host in which it lives.
- Symmetry:** Flatworms have bilateral symmetry and they have a definite head and tail region.
- Specialized Structures:** 1. The planaria has a pair of eyespots at its anterior or front end. These eyespots detect light which the planaria avoids so they are less visible to their predators. 2. The tapeworm like other parasitic worms has a thick protective cuticle on the outside of its body. The cuticle protects the worm from being digested by the strong digestive enzymes of its host.

### 4. Phylum Nematoda – The Roundworms

- Habitat:** fresh and salt water; terrestrial
- Body Plan:** The body of a roundworm is long, smooth and unsegmented. Their cylindrical bodies are tapered at both ends and are covered by a protective cuticle. Three tissue layers; ecto, endo and mesoderm.
- Digestive System:** Roundworms have a complete digestive system which means their digestive tract has 2 openings; a mouth to ingest food and an anus to egest waste.
- Symmetry:** Bilateral symmetry with an anterior end and a posterior end.
- Interesting Facts:** 1. Free-living roundworms are extremely plentiful in soil and are essential in producing quality soil. 2. Pinworms are common parasitic roundworms found in children.

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**5. Phylum Annelida – The Segmented Worms: earthworm, leech, sandworm**

- a.) Habitat: marine, freshwater, terrestrial
- b.) Body Plan: similar shape as the roundworm but the body is segmented both internally and externally which allows for a quicker response for movement.
- c.) Digestive System: Segmented worms have a complete digestive system and this set-up is often referred to as a tube-within-a-tube body plan.
- d.) Symmetry: Bilateral; anterior and posterior ends; dorsal and ventral surfaces.

**6. Phylum Arthropoda – The Arthropods: insects, spiders, crustaceans**

- a.) Habitat: arthropods are found in all environments.
- b.) Numbers: Arthropods are the most successful of any animal group. This is mainly due to the success of insects, which has more than a million different species.
- c.) Body Plan: Arthropods have a segmented body with paired jointed appendages that provide excellent movement for walking, swimming, flying, grabbing, fighting, digging and biting just to name a few. In most arthropods the body is divided into a head, abdomen and thorax.
- d.) Exoskeleton: The outside skeleton of arthropods is made of chitin which protects the soft body of this animal and prevents water loss allowing them to live successfully on land.
- e.) Symmetry: Bilateral

**7. Phylum Mollusca – The Mollusks: clams, snails, oysters, octopus**

- a.) Habitat: marine and fresh water; terrestrial
- b.) Body Plan: Mollusks have a soft, unsegmented body and often move with a strong muscular foot on its ventral surface.
- c.) The radula: Mollusks are well known for their tongue-like organ called the radula which has many rows of teeth and is used to scrape food from the surface of plants and rocks.
- d.) The mantle: The mantle is a fold of skin that surrounds the body organs. The mantle acts like a gland because it is capable of secretion. These secretions harden to help form the shells of mollusks.
- e.) Symmetry: bilateral

**8. Phylum Echinodermata – The Echinoderms: sea stars, sea urchins**

- a.) Habitat: all are marine living mainly on the ocean floor.
- b.) Body: Echinoderms have an internal, limy skeleton and a spiny outside surface or skin. These structures give both support and protection.
- c.) Water-vascular System: Echinoderms like sea stars and sea urchins are well known for their water-vascular system which consist of water-filled tubes that run through their body. By moving water in and out of these tubes echinoderms can move on “jets” of water or use their tubed feet as suction cups.
- d.) Digestive System: complete
- e.) Symmetry: Radial

**9. Phylum Chordata – The Chordates: fish, reptiles, amphibians, birds, mammals**

- a.) Habitat: marine, freshwater, or terrestrial
- b.) Symmetry: bilateral
- c.) Dorsal nerve cord.
- d.) Chordates have a flexible, supporting rod or notochord on their dorsal side. In the invertebrates the notochord remains stiff and flexible. In the vertebrates, cartilage or bone replaces the notochord to form a supporting backbone.